AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Currently Amended) A double tube type thermosyphon device in which an inner tube is disposed to be longitudinally passed through an outer tube disposed to be horizontally long, in which a working space defined between the outer tube and the inner tube is provided with an operating liquid and is hermetically closed, and in which heat exchange is performed between an outside and an inside of the outer tube while allowing a thermal source fluid to flow through the inner tube, the double tube type thermosyphon device wherein:

a large number of circumferentially formed narrow concave grooves are formed both in an inner wall surface of the outer tube facing the working space and in an outer wall surface of the inner tube facing the working space;

the operating liquid is contained in the working space, and has such a liquid surface height as to soak the inner tube in the operating liquid in a state in which a part of the inner tube appears above a liquid surface of the operating liquid; and

the operating liquid is raised in a circumferential direction of the wall surface by capillary attraction via the narrow concave grooves, and is

evaporated on an evaporating portion of either of the inner wall surface of the outer tube and the outer wall surface of the inner tube, whereas the operating liquid is condensed on the other wall surface, so that the outside of the outer tube is cooled or heated.

2. (Original) The thermosyphon device of claim 1, wherein the narrow concave groove has a groove width Wg shown in mathematical expression (1) as an allowable maximum groove width, and has a groove depth Hg shown in mathematical expression (2):

[Formula 1]

$$Wg \leq \frac{2\sigma \cos \theta \min}{\rho \ell g D}$$

[Formula 2]

$$Hg \geq \frac{Wg}{2}$$

3. (Original) The thermosyphon device of claim 1 ~~or claim 2~~, characterized by being of an eccentric double tube type in which the inner tube has an axial center located at a position deviated from an axial center of the outer tube and in which the axial center of the inner tube is located below the axial center of the outer tube.

4. (Currently Amended) A cooling and heating device that uses the thermosyphon device of claim 1 ~~any one of claims 1 to 3~~ and that performs switching between a cold fluid and a hot fluid serving as a thermal source fluids, and cools and heats surroundings of the device as a single device.

5. (Cancelled)

6. (Currently Amended) A cooling and heating method using a diouble tube type thermosyphon in which an inner tube is disposed to be longitudinally passed through an outer tube disposed to be horizontally long, in which a working space defined between the outer tube and the inner tube is provided with an operating liquid and is hermetically closed, and in which heat exchange is performed between an outside and an inside of the outer tube while allowing a thermal source fluid to flow through the inner tube, the double tube type thermosyphon wherein:

a large number of circumferentially formed narrow concave grooves are formed both in an inner wall surface of the outer tube facing the working space and in an outer wall surface of the inner tube facing the working space;

a liquid surface height of the operating liquid being set so that a part of the inner tube appears above a liquid surface of the operating liquid;

the operating liquid is always borne on the tube surfaces by capillary attraction via the narrow concave grooves; and

the outside of the outer tube is cooled or heated in accordance with the thermal source fluid while guiding the operating liquid upwardly and downwardly on the surface of each tube.

7. (Currently Amended) A plant cultivating method carried out by burying the thermosyphon device of claim 1 ~~any one of claims 1 to 4~~ in plant cultivating soil.